

**Appendix 1 (as supplied by the authors): Listing of all unique quality indicators**

Unique Quality Indicator	Measurement 1 [Organization]	Measurement 2 [Organization]	Endorsing Organizations
<b>Mechanical Ventilation</b>			
VAP bundle (IHI) <ul style="list-style-type: none"> <li>• Elevation of head of bed to between 30 and 45 degrees</li> <li>• Daily sedation vacations and assessment of readiness to extubate</li> <li>• Peptic ulcer disease prophylaxis</li> <li>• DVT prophylaxis (unless contraindicated)</li> <li>• Daily oral care with chlorhexidine</li> </ul>	VAP rate per 1000 ventilator days = Number of VAP cases / Number of ventilator days x 1000 [IHI]	Reliability of ventilator bundle compliance = Number ventilated patient receiving all 5 bundle elements / Number of patients on ventilators for day of sample [IHI]	IHI
VAP bundle (SHN) <ul style="list-style-type: none"> <li>• Elevation of head of bed to between 30 and 45 degrees when possible, otherwise attempt to maintain head of bed greater than 30 degrees should be considered</li> <li>• Daily evaluation of readiness for extubation</li> <li>• Utilization of endotracheal tubes with subglottic secretion drainage</li> <li>• Oral care and decontamination with chlorhexidine</li> <li>• Initiation of safe enteral nutrition within 24-48h of ICU admission</li> </ul> Additional components: <ul style="list-style-type: none"> <li>• Hand hygiene</li> <li>• Promote mobility</li> <li>• VTE prophylaxis</li> </ul>	VAP rate per 100 ventilator days = Number of VAP cases / Number of ventilator days x 1000 [CPSI(SHN)]	Bundle compliance = Number of patients receiving all 5 components of VAP bundle / Number of patients on ventilators on the day of sample [CPSI(SHN)]	CPSI (SHN)
VAP bundle (AHRQ) <ul style="list-style-type: none"> <li>• Head of bed elevation</li> <li>• Sedation vacation</li> <li>• Oral care using chlorhexidine</li> <li>• Subglottic suctioning endotracheal tubes</li> </ul>			AHRQ
VAP bundle (Pediatrics)	VAP rate per 100 ventilator days = Number of VAP	Bundle compliance = Number of patients receiving	CPSI (SHN)

<ul style="list-style-type: none"> <li>• Elevate head of bed 30-45 degrees</li> <li>• Proper NG or OG tube positioning in infants and children</li> <li>• Oral care for all children</li> <li>• Eliminate routine instill for suctioning in pediatric patients</li> <li>• Keep ventilator tubing in dependent position</li> </ul> <p>Additional components:</p> <ul style="list-style-type: none"> <li>• Hand hygiene</li> <li>• Oral decontamination in children</li> </ul>	cases / Number of ventilator days x 1000 [CPSI(SHN)]	all 5 components of VAP bundle / Number of patients on ventilators on the day of sample [CPSI(SHN)]	
VAP Rate	VAP rate after 48h of mechanical ventilation per 100 ventilator days = Number of VAP cases / Number of ventilator days x 1000 [CPSI(SHN)]	VAP rate per 100 ventilator days = Number of VAP cases / Number of ventilator days x 1000 [CPSI(CCVSM), OCCS, IHI, ACCCN, HQO]	CPSI (SHN), CPSI (CCVSM), OCCS, IHI, ACCCN, HQO
Patients ventilated <24 after admission	Percentage of ventilated admissions successfully extubated <24h after admission [ACCCN]		ACCCN
Ventilator utilization	(Invasive ventilation days + noninvasive ventilator days) as a percentage of total patient days [ACCCN]		ACCCN
Invasive ventilator utilization	Invasive ventilator days as a percentage of total patient days [ACCCN]	Total days of mechanical ventilation / Total patient days OR Total invasive mechanical ventilation days / total patient days [CPSI(CCVSM), OCCS]	ACCCN, CPSI (CCVSM), OCCS
Ventilator volume	Number of invasively mechanically ventilated patients per bed per month [ACCCN]		ACCCN
Inspiratory plateau pressure	Number of mechanically ventilated patients with median inspiratory plateau pressures maintained <30cmH20 for severe septic shock over the first 24h following the time of presentation / Number of mechanically ventilated patients presenting with severe sepsis and/or septic shock [SCCM, ESICM]		SCCM, ESICM
Mechanical ventilation with delivery of appropriate tidal volumes	Number of MV days associated with documented tidal volume <8mL/kg/ideal body weight / Total number of MV days per reporting period x 1000 [ACCCN]		ACCCN
Pneumonia: Blood cultures performed within 24h or prior to arrival	Number of pneumonia patients transferred or admitted to the ICU within 24h of hospital arrival	Number of pneumonia patients transferred or admitted to the intensive care unit (ICU) within 24	NQF, NQMC

	who had blood cultures performed within 24h prior to or 24h after arrival at the hospital / Patients >18y/o discharged with: ICD-9-CM principal diagnosis code of pneumonia or ICD-9-CM principal diagnosis code of septicemia or respiratory failure (acute or chronic) AND an ICD-9-CM other diagnosis code of pneumonia [NQF]	hours of hospital arrival who had blood cultures performed within 24 hours prior to or 24 hours after arrival at the hospital / Pneumonia intensive care unit (ICU) patients, 18 years of age and older, who are transferred or admitted to the ICU within 24 hours of hospital arrival [NQMC]	
Pneumonia: antibiotics consistent with guidelines	ICU pneumonia patients who received an initial antibiotic regimen consistent with current guidelines during the first 24 hours of their hospitalization / ICU pneumonia patients who received an initial antibiotic regimen consistent with current guidelines during the first 24 hours of their hospitalization [NQMC]		NQMC
Unplanned extubation rate	Number of unplanned extubations / Total number of mechanically ventilated days in the quarter x 100 (Number per 100 days of mechanical ventilation) [ACCCN]	Number of unplanned extubations x 1000 / Sum of invasive mechanical ventilation days (Number of unplanned per 1000 MV days) [CPSI(CCVSM), OCCS]	ACCCN, CPSI (CCVSM), OCCS
Ventilated patient flow	Number of ICU patients having received (invasive, noninvasive or both) mechanical ventilation only / Number of ICU beds usually available for patient care [CPSI(CCVSM)]		CPSI (CCVSM)
<b>Invasive Procedures</b>			
Central line insertion bundle (SHN) <ul style="list-style-type: none"> <li>• Hand hygiene (alcohol based)</li> <li>• Maximal barrier precautions</li> <li>• Chlorhexidine skin antisepsis</li> <li>• Optimal catheter type and site selection</li> </ul>	Total number of ICU related blood stream infections after 48 hours of central line placement / Total number of central line days for ICU patients 18 years and older x 1000 [CPSI(SHN)]	Number with all 4 elements of central line insertion bundle / Number with central venous catheter on the day of the sample x 100 [CPSI(SHN)]	CPSI (SHN), Accreditation Canada, ACCCN
Central line care bundle (SHN) <ul style="list-style-type: none"> <li>• Daily review of line necessity with prompt removal of unnecessary lines</li> <li>• Aseptic lumen access</li> <li>• Catheter site and tubing care</li> </ul>	Number with all 3 elements of central line care bundle / Number with CVC on the day of the sample x 100 [CPSI(SHN)]		CPSI (SHN)
Central line bundle (IHI) <ul style="list-style-type: none"> <li>• Hand hygiene</li> <li>• Maximal barrier precautions on insertion</li> <li>• Chlorhexidine skin antisepsis</li> </ul>	Number of ICU patients with central lines for whom all elements of central line bundle are documented and in place / total number of ICU patients with central lines on day of week sample [IHI]		IHI

<ul style="list-style-type: none"> <li>• Optimal catheter site selection</li> <li>• Daily review of line necessity with prompt removal of unnecessary lines</li> </ul>			
<p>Central line insertion protocol with maximal sterile barrier technique. Maximal sterile barrier precautions includes all of the following:</p> <ul style="list-style-type: none"> <li>• Cap &amp; mask</li> <li>• Sterile gown &amp; gloves</li> <li>• Large sterile sheet</li> <li>• Hand hygiene</li> <li>• 2% chlorhexidine antiseptis</li> </ul>	<p>Patients for whom central venous catheter was inserted with all elements of maximal sterile barrier technique / All patients who undergo central venous catheter insertion [NQMC]</p>		NQMC
<p>Measures to prevent central line associated bloodstream infection at time of central venous catheter insertion</p>	<p>Patients for whom central venous catheter was inserted with all elements of maximal sterile barrier technique / All patients who undergo central venous catheter insertion [NQF]</p>		NQF
<p>Ultrasound guidance for central venous catheter insertion</p>	<p>Number of adult patients aged 18 years and older who underwent ultrasound guided internal jugular central venous catheter insertion in the emergency department / Number of adult patients aged 18 years and older who underwent internal jugular central venous catheter insertion in the emergency department [NQF]</p>		NQF, AHRQ
<p>Catheter related blood stream infection rate</p>	<p>Catheter related blood stream infections / central line days x 1000 [ACCCN, OCCS, IHI, ANZICS]</p>	<p>Number of new cases of central line related blood stream infection in ICU after at least 48 hours of receiving a central line during the reporting period / Number of central line days in that reporting period [HQO]</p>	ACCCN, OCCS, ICS, IHI, ANZCS, HQO, NQF
<p>Occurrence of pneumothorax as a result of central venous catheter placement</p>	<p>Percentage of central venous catheter placements (attempts) associated with pneumothorax requiring tube thoracotomy [ACCCN]</p>		ACCCN
<p>Occurrence of inadvertent arterial cannulation as a result of central venous catheter placement</p>	<p>Percentage of central venous catheter placements (attempts) associated with arterial cannulation of said catheter [ACCCN]</p>		ACCCN
<p>Iatrogenic pneumothorax in non neonates</p>	<p>Discharges among cases meeting the inclusion and exclusion rules for the denominator with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code of iatrogenic pneumothorax in any secondary</p>		NQMC, AHRQ

	diagnosis field / All surgical and medical discharges under age 18 defined by specific Diagnosis-Related Groups (DRGs) and Medicare Severity DRGs (MS-DRGs) [NQMC]		
<b>Patient Centered and End of Life Care</b>			
Family conference	Percentage of ICU patients with a length of stay >48h for which a family conference took place within first 48h of admission to ICU [ACCCN]	Percentage ICU patients with a length of stay >48h who die within ICU and for whom a family conference is held 48h prior to death [ACCCN]	ACCCN
Psychosocial support	Percentage of ICU patients with a length of stay > 48h who die within the ICU and for whom psychosocial support was offered to the family [ACCCN]		ACCCN
Spiritual support	Percentage ICU patients with length of stay > 48h who die within the ICU and for whom the services of a spiritual advisor/pastor/priest was offered to the family [ACCCN]		ACCCN
Bereavement package	Percentage ICU patients with a length of stay >48h who die within the ICU and for whom a bereavement package was offered to family [ACCCN]		ACCCN
End of life pathway in place	Number deaths where domains were addressed, either by use of Liverpool Care Pathway or an alternative tool incorporating these measures / Number of deaths in the ICU [ICS]		ICS
Comfortable dying	Patients whose pain was brought to a comfortable level (as defined by patient) within 48h of initial assessment / Patients who replied "yes" when asked if they were uncomfortable because of pain at the initial assessment [NQF]		NQF
Goals of care documentation	Percentage of ICU patient deaths with patient receiving full interventions (R1) vs limitations (R2 & R3) versus patient receiving palliative care (C2) [ACCCN]	Patients in the denominator who had their care preferences documented within 48h of ICU admission or have documentation of why this was not done/ All vulnerable adults admitted to ICU who survive at least 48h after ICU admission [NQF]	ACCCN, NQF, AHRQ
Family and patient satisfaction	Scores (maximum possible 100) provided for FS-ICU total, FS-ICU decision making, and FS-ICU care [CPSI(CCVSM)]		CPSI (CCVSM), OCCS, ACCCN
Health related quality of life			ACCCN
Sedation and restraint			ACCCN,

			OCCS
Deaths in ICU with provision of cardiopulmonary resuscitation	Percentage of ICU patient deaths with patient receiving external cardiac massage prior (within 1 hour) to actual declaration of death [ACCCN]		ACCCN
In-hospital deaths occurring in an ICU environment	Number ICU deaths (ICU includes all units capable of MV) / Total number hospital deaths per reporting period x 100 [ACCCN]		ACCCN
Code blues	Number of cardiac arrest resuscitations (need for closed chest cardiac massage and/or defibrillation) per 1000 hospital discharges per reporting period [ACCCN]		ACCCN
Organ donation			OCCS
Two patient identifiers before service or procedure			Accreditation Canada
<b>Sepsis Management</b>			
IHI Sepsis Management bundle <ul style="list-style-type: none"> <li>Administer low dose steroids by standard policy</li> <li>Maintain adequate glycemic control</li> <li>Prevent excessive inspiratory plateau pressures</li> </ul>	Percentage of cases of severe sepsis or septic shock that completed all applicable Sepsis Management Bundle elements / total number patients with severe sepsis and/or septic shock [IHI]		IHI
IHI Sepsis Resuscitation bundle <ul style="list-style-type: none"> <li>Serum lactate measured</li> <li>Blood cultures obtained prior to antibiotic administration</li> <li>Improve time to broad spectrum antibiotics</li> <li>Treat hypotension and/or elevated lactate with fluids</li> <li>Apply vasopressors for ongoing hypotension</li> <li>Maintain adequate CVP</li> </ul> Maintain adequate central venous oxygen saturation.	Percentage of cases of severe sepsis or septic shock that completed all applicable Sepsis Resuscitation Bundle elements / total number patients with severe sepsis and/or septic shock [IHI]		IHI
Severe sepsis treatment	Number of patients who meet criteria for severe sepsis and septic shock who had orders for 1) blood, urine and appropriate cultures 2) broad spectrum antibiotics 3) fluids 4) measurement of lactate		NQF, OCCS

	clearance / Number of patients diagnosed in the ED with severe sepsis and septic shock [NQF]		
Low dose steroid administration	Number of patients for whom administration of low-dose glucocorticoids for septic shock was determined in accordance with a standardized policy over the first 24h following presentation / Total number of patients with septic shock [SCCM, ESICM]		SCCM, ESICM
Lactate measure by time goal	Number of patients who had appropriate lactate measurement by time goal as specified in guideline / Number of patients with confirmed severe sepsis/septic shock, only severe sepsis, only septic shock or patients without confirmed severe sepsis/septic shock but admitted to hospital for IV antibiotics [BCPSQC]		BCPSQC
Antibiotic by time goal	The median time in minutes to broad-spectrum antibiotic(s) administration for severe sepsis and/or septic shock following the time of presentation [SCCM, ESICM]	Number of patients who received antibiotics in ED by the time goals specified by guidelines. / Number of patients with confirmed severe sepsis/septic shock, only severe sepsis, only septic shock or patients without confirmed severe sepsis/septic shock but admitted to hospital for IV antibiotics [BCPSQC]	SCCM, ESICM, BCPSQC
Blood cultures before antibiotics	The number of patients who had blood cultures collected before broad spectrum antibiotic administration for severe sepsis and/or septic shock over the first 6 hours following the time of presentation / The number of patients presenting with severe sepsis and/or septic shock [SCCM, ESICM]	Number of patients who have blood cultures taken before antibiotics / Number of patients with confirmed severe sepsis/septic shock, only severe sepsis, only septic shock, or patients without confirmed severe sepsis/septic shock but admitted to hospital for IV antibiotics [BCPSQC]	SCCM, ESICM, BCPSQC
Sepsis patients with second litre crystalloid before time goal	Number of patients who have 2nd litre of crystalloid initiated by time goal as specified in Sepsis Guidelines / Number of patients with confirmed severe sepsis/septic shock, only severe sepsis, only septic shock [BCPSQC]		BCPSQC
Maintain adequate CVP	The number of patients for whom a goal CVP of $\geq 8$ mmHg was achieved for septic shock or lactate $> 4$ over the first 6 hours following the time of presentation [SCCM, ESICM]		SCCM, ESICM
Sepsis management bundle reliability	Percentage of cases of severe sepsis or septic shock that completed all applicable Sepsis Management Bundle elements / total number patients with severe sepsis and/or septic shock [IHI]		IHI, SCCM, ESICM
Sepsis resuscitation bundle reliability	Percentage of cases of severe sepsis or septic shock		IHI, SCCM,

	that completed all applicable Sepsis Resuscitation Bundle elements / total number patients with severe sepsis and/or septic shock [IHI]		ESICM
Mortality due to sepsis and septic shock	Number of cases of death due to severe sepsis and septic shock / The total number of patients with severe sepsis and septic shock [IHI, ESICM, SCCM]	Number of patients who die in hospital within 28 days of presentation to ED with confirmed severe sepsis/septic shock or both / Number of patients with confirmed severe sepsis/septic shock or both [BCPSQC]	IHI, SCCM, ESICM, BCPSQC
Glucose control or glycemic control policies	The number of patients for whom glucose values were maintained greater than the lower limit of normal and with a median value <150 (8.3) for severe sepsis and/or septic shock over the period 6 hours to 24h following the time of presentation. / Number of patients presenting with severe sepsis and/or septic shock [SCCM, ESICM]	The blood glucose values for all days the patient is on insulin infusion are input into an "Area under the Curve" analysis which provides the hyperglycemic index for each patient. A central analyst will supply AUC analysis and provide each patient's hyperglycemic index back to the Health authority [BCPSQC]	SCCM, ESICM, BCPSQC, AHRQ, IHI
Evaluation of glycemic control and incidence of severe hypoglycemia	1) Glucose values < 2.2 / total number glucose values collected 2) Percentage of blood sugars in 60-180mg/dL 3) Percentage of blood sugars 0-59mg/dL 4) Percentage of blood sugars >181mg/dL (balancing) [IHI]	All glucose test results of <3.5mmol/L are counted and included in the numerator. The denominator is the sum of (patients on insulin x days on insulin) [BCPSQC]	IHI, BCPSQC
<b>Prophylaxis and Preventable Adverse Events</b>			
Deep venous thrombosis/venous thromboembolism prophylaxis	Number of patient days with appropriate DVT prophylaxis as a percentage of total ICU patient days in a reporting period [ACCCN, OCCS]	Total number of adult patients being treated appropriately for VTE prophylaxis / Total number of adult admissions into the ICU [ANZICS, BCPSQC, NQF]	OCCS, ACCCN, CPSI (SHN), ANZICS, BCPSQC, NQF, Accreditation Canada, NQMC, AHRQ
Diagnosis of new venous thromboembolism after ICU admission	Number of confirmed diagnosis of DVT/PE at least 48h after ICU admission / total ICU days per reporting period x 1000 [ACCCN]		ACCCN
Peptic ulcer disease prophylaxis	Number of patient days with appropriate PUD prophylaxis as a percentage of total ICU patient days in a reporting period [ACCCN]		AHRQ, ACCCN
Appropriate transfusion practices	Percentage of patients who receive transfusion with a	Pre-transfusion hemoglobin, number of units	IHI, ACCCN,



	pre-transfusion documented HgB of >8g/dL [ACCCN]	transfused at each episode, proportion of patients with documented consent prior to transfusion, proportion of transfusion episodes with documentation that patient met functional assessment criteria, proportion of medical records with documentation of indication to transfuse [IHI]	OCCS
Medication errors	Total number of medication errors / total ICU days per reporting period x 1000 [ACCCN]		ACCCN
Medication reconciliation	Process measures: percentage of patients reconciled at admission, percentage of patients reconciled at discharge Outcome measures: Mean number of unintentional discrepancies per patient (error of omission and commission), mean number of undocumented intentional discrepancies per patient (failure of communication) [CPSI(SHN)]	Process measures: Percentage of unreconciled medications, unreconciled medication per 100 admissions Outcome measures: Prevalence of adverse drug events [IHI]	ACCCN, Accreditation Canada, CPSI (SHN), IHI
Medication reconciliation by pharmacist			AHRQ
Rate of new GI bleeding	Number of significant (requiring transfusion PRBCs) GI bleeding events (proven source at endoscopy) acquired while in ICU / Days of MV per reporting period x 1000 [ACCCN]		ACCCN
Patient falls	Total number of patient falls (with or without injury to the patient and whether or not assisted by a staff member) by hospital unit during the calendar month x 1000 / Patient days by hospital unit during the calendar month [NQF]		NQF
Falls with injury	Total number of patient falls of injury level minor or greater (whether or not assisted by a staff member) by eligible hospital unit during the calendar month x 1000 / Patient day by type of unit during the calendar month [NQF]		NQF
Decubitus ulcer rate	Number of patients with a stage 2 or > (NPUAP Staging) decubitus ulcer on admission to the ICU / total number of ICU admissions during the same reporting period x 100 [ACCCN]	Number of ICU-acquired cases of a stage 2 or > (NPUAP Staging) decubitus ulcer / ICU patient days / 1000 [ACCCN]	ACCCN
Preventing pressure ulcers	Process measures: 1) Percentage of patients receiving pressure ulcer assessment on admission 2) Percent of at-risk patients receiving full pressure ulcer preventative care 3) Percentage patients receiving daily pressure ulcer risk assessment.		IHI, AHRQ

	Outcome measures: 1) Pressure ulcer prevalence (regardless of whether it developed during or before current admission) [IHI]		
Pediatric pressure ulcer rate per 1000 admissions	Discharges among cases meeting the inclusion and exclusion rules for the denominator with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code of decubitus ulcer in any secondary diagnosis field / All surgical and medical discharges under age 18 defined by specific Diagnosis-Related Groups (DRGs) and Medicare Severity DRGs (MS-DRGs) [NQMC]		NQMC, AHRQ
Early nutrition	Number of patients receiving early enteral nutrition / all patients admitted to ICU who do not have a contra-indication to receiving early enteral nutrition [ICS]		ICS, OCCS
<b>Infection Control</b>			
Isolation of patients with resistant infections	Number of patients isolated appropriately in a time period / Number of patients on the unit with possibility of cross-contamination (MRSA, VRE, ESBL, TB or any other cases which the hospital infection control department judges should be in isolation facilities in a time period) [ICS]		ICS, AHRQ
Hand hygiene	Number of times appropriate hand hygiene is performed / Number of opportunities for appropriate hand hygiene as delineated in the EPIC guidelines [ICS]	Number of compliant (i.e. appropriate) hand hygiene events before and after patient contact / Number of total hand hygiene opportunities before and after patient contact [HQO, BCPSQC]	ICS, HQO, BCPSQC, AHRQ
Reduce antibiotic resistant organisms	Many suggested: 1) Completion of hand hygiene product worksheet (bundle compliance) 2) Hand hygiene observations 3) Environmental cleaning worksheet (% of "high touch areas" in patient environment where there was appropriate environmental cleaning) 4) Contact precautions measures (time to placement on contact precautions, time to lab notification to placement on contact precautions, 5) Active screening on admission per 1000 admissions 6) Surveillance for MRSA clinical isolates [CPSI (SHN)]	ICU acquired cases / ICU patient days x 1000 [CPSI(CCVSM)]	CSPI (SHN), CPSI (CCVSM)
Unit acquired bacteremias	Number of bacteremias reported in patients admitted to the ICU for more than 48h / 1000 patient days [ICS]		ICS

Methicillin sensitive <i>S. aureus</i> bacteremia			NHS
Unit acquired methicillin resistant <i>S. aureus</i> bacteremia	Number of unit acquired MRSA acquisition after 48h in ICU, assuming admission screening has been performed / 1000 bed days [ICS]	New cases observed in hospital during the reporting period / Number of patient-days per reporting period [HQQ]	ICS, NHQ, HQO
Vancomycin resistant enterococcus bacteremia	Number of new cases observed in hospital during reporting period / Number of patient-days per reporting period		HQO
Unit acquired <i>C. difficile</i> or methicillin resistant <i>S. aureus</i> infection	Number of cases of <i>C. difficile</i> or MRSA presenting per time period / total number of patients admitted per time period [ICS]	ARO incidence: MRSA ICU acquired cases/1000 ICU patient days ARO prevalence: MRSA admission cases/discharges/1000 [ACCCN]	ICS, HQO, Accreditation Canada, ACCCN
Catheter-associated UTI (CAUTI)	Total number of observed healthcare-associated CAUTI among inpatients in ICUs (excluding patients in NICUs), SCAs, and other inpatient locations / Total number of expected CAUTIs, which is calculated by multiplying the number of urinary catheter days for each location under surveillance for CAUTI during the period by the CAUTI rate for the same types of locations obtained from the standard population [NQF]		NQF
<b>Staffing</b>			
Nurse to patient ratios	Number of funded beds at both level three and level two within the unit / Number of whole time equivalent trained nursing staff [ICS]	Number of RNs or LPNs / ICU Bed ACCCN]	ICS, ACCCN
Staffing ratios			AHRQ
Respiratory therapist to patient ratios	Number of RTs / ICU Bed / Shift [ACCCN]		ACCCN
Intensivist to patient ratios			ACCCN, ICS
Core staffing by level of acuity			OCCS
Closed unit (intensivist model)			IHI, OCCS
Intensivist led management model by level of acuity			OCCS
In-house physician resources			ACCCN
Workload	Mean daily ICU workload score RN/RT/ICU bed per working period [ACCCN]	Mean daily ratio of actual to projected staffing requirements based on workload measurements scores per reporting period [ACCCN]	ACCCN
Rapid response team establishment	1) Total number rapid response system (RRS) calls to adult patients / Total number adult hospital admissions 2) Total number RRS calls within 24h of		IHI, CPSI (SHN), ANZICS,

	admission to hospital / Total number of adult hospital admissions 3) Total number of adult patients who have experienced a cardiopulmonary arrest / Total number of adult hospital admissions 4) Total number of adult deaths in all patients / Total number of adult hospital admissions [ANZICS]		AHRQ
Utilization of rapid response team (RRT)	Number of calls to the RRT per 1000 discharges in a defined time period to assess that the team is being utilized and to measure its effectiveness [IHI]		IHI
Multidisciplinary rounds take place			ICS, IHI
Pharmacist on rounds			AHRQ
Training on infusion pumps			Accreditation Canada, AHRQ
Daily goals	Number of patient ICU days with documented daily goals of care / total ICU days per reporting period x 100 [ACCCN]		ACCCN, ICS, IHI
Staff turnover	Turnover calculation = (Transfers + Terminations)/((Count at beginning of Quarter + Count at End of Quarter)/2) [ACCCN]		ACCCN
Nurse turnover	Nurse turnover rate = Number of nurses leaving ICU in a specific quarter / total number of nurses (actual number, not FT equivalent) working in the ICU in that same quarter [CPSI(CCVSM, OCCS)]		CPSI (CCVSM), OCCS
RN absenteeism	Total paid sick time / total paid hours [ACCCN]	Absenteeism rate = number sick hours per fiscal quarter / total number of base hours per fiscal quarter [CPSI(CCVSM), OCCS]	ACCCN, CPSI (CCVSM), OCCS
Nurse overtime work hours	Run chart showing variation between budget and actual overtime as a percentage of paid hours. Percentage of overtime worked versus percentage sick time used (as total percentage of total paid hours). [ACCCN]	Number of overtime hours per fiscal quarter / total worked hours per fiscal quarter [CPSI(CCVSM), OCCS]	ACCCN, CPSI (CCVSM), OCCS
CritiCall availability			OCCS
Critical care networks			OCCS
<b>Patient Flow and Volume</b>			
Number of non-clinical transfers	Number of onclinical transfers from other hospitals / number of admissions to the ICU [ICS]		ICS
Repatriation			OCCS
Delays in patient admission to the ICU	Percentage of ICU admissions associated with a delay		ACCCN,

	in admission to the ICU [ACCCN]		OCCS
Cancelled OR Cases	Number of OR cases cancelled per reporting period because of lack of ICU beds [ACCCN]		ACCCN, OCCS
Interfacility ICU transfers	Number of transfers per month / Number of live discharges for each type of transfer (medical necessity vs bed management) [ACCCN]	Interfacility transfers per month / Number of live discharges per month [CPSI(CCVSM), OCCS]	ACCCN, OCCS, CPSI (CCVSM)
Access and exit block	1) Appropriate adult patients referred to an ICU who have documented evidence by an intensivist that they could not be admitted to the unit because of inadequate resources / Total number of adult admissions to ICU plus nonadmissions resulting from inadequate resources 2) Number of adult elective surgical cases deferred or cancelled due to lack of ICU bed / Total number of adult admissions to ICU plus non-admissions resulting from numerator 3) Number of adults transferred to another facility/ICU due to unavailability of ICU bed / total number of adult admissions to ICU plus numerator 4) Total number of adult patients whose discharge from ICU was delayed more than 6h / total number adult patients discharged alone from the ICU 5) Total number of adult patients discharged from the ICU between 6PM and 6AM / total number of alive discharges from ICU [ANZICS]		ANZICS
Avoidable days	Total avoidable days / Total ICU patient days [ACCCN]	1) Total avoidable days / total ICU patient days 2) Total avoidable days in given time period / number of calendar days in given time period [CPSI(CCVSM), OCCS]	ACCCN, CPSI (CCVSM), OCCS
Case volume	Number of admissions/month and number of patients/bed/month [ACCCN]	1) Number of days where ICU is at or over census 2) Percentage of days where ICU is at census or over census 3) Average occupancy (average maximum census + average minimum census) / 2xnumber of beds [CPSI(CCVSM), OCCS]	ACCCN
Occupancy	Number of days with peak occupancies > 95% / total days in reporting period x 100 [ACCCN]		ACCCN, CPSI (CCVSM), OCCS, ICS
Time from ICU to inpatient bed			IHI
Number of unplanned transfers	Number of unplanned transfers of inpatients to another hospital for medical, surgical, obstetrical care or for clinical management / Number of inpatients		NHS

	who have been discharged, excluding deaths [NHS]		
Handover (intra and inter ICU)			ACCCN, Accreditation Canada
ICU length of stay	LOS (days) = ICU discharge date/time - ICU admit date/time. Also consider 1) total patient days 2) mean LOS (days) 3) median LOS [CPSI(CCVSM)]	For all eligible patients admitted to the ICU, the time at discharge from ICU (either death or physical departure from the unit) minus the time of admission (first recorded vital sign on ICU flow sheet) / Total number of eligible patients who are discharged (including deaths and transfers) [NQF]	ACCCN, OCCS, IHI, CPSI (CCVSM), NHS, NQF, VA
PICU severity adjusted length of stay	Number of PICU days / Discharges from the PICU (including transfers to other units) during the time period being reported [NQF]		NQF
Deaths within 6 hours of admission	Number of patients dying within 6 hours of admission / total number of ICU admissions during the same reporting period x 100 [ACCCN]		ACCCN
<b>ICU Discharges</b>			
Number of crash calls per 1000 inpatient discharges	Number of inpatient codes / total number inpatient discharges x 1000 [IHI]		IHI
Clinical deterioration of ICU discharges within 72 hours	Total number of rapid response calls to adult ICU patients within 72h of being discharged from the ICU, during the 6 month time period / Total number of adult patients discharged alive from the ICU unit, during the 6 month time period [ANZICS]		ANZICS
Night time discharges	Number discharges between the hours of 2201 and 0659 / All live discharges from ICU [ICS]	Number of night time discharges to non-ICU area / live discharges to non-ICU area [CPSI(CCVSM), OCCS]	ACCCN, ICS, CPSI (CCVSM), OCCS, VA
Patient transport out of the ICU using two identifiers			ACCCN
ICU readmissions	Number of readmissions / live discharges to the ward [CPSI(CCVSM), OCCS]		ACCCN, CPSI (CCVSM), OCCS
ICU readmissions within 48 hours	Number of readmissions within 48h / all live discharges from ICU [ICS]		ICS, VA
PICU unplanned readmission rate	Total number of unplanned readmission within 24h after discharge or transfer from the PICU / 100 PICU discharges [NQF]		NQF
<b>Quality Improvement</b>			
Quality improvement program in place			ICS

Utilization of patient assessment systems	1) Total number of adult ICU submissions to the ANZICS CORE Adult Patient Database with completed information and review of results / Total number of adult admissions into the ICU 2) Question: Have you responded to the most recent ANZICS CORE Critical Care Resources Survey? [ANZICS]		ANZICS
Regular review of morbidity and mortality			ICS
<b>Mortality and Severity of Illness</b>			
Acuity of illness or burden of disease for patients treated in ICU (SOFA score)			ACCCN
Standardized mortality ratio	ICU mortality rate = ICU deaths / Total discharges & deaths x 100 [CPSI(CCCVSM)]	Total number of eligible patients whose hospital outcome is death / Total number of eligible patients who are discharged (including deaths and transfers) [NQF, NHS, BCPSQC]	ICS, CPSI (CCVSM), NHQ, BCPSQC, ACCCN, OCCS, NQF, VA
PICU standardized mortality ratio	Actual number of deaths occurring in PICU / Predicted mortality "Predicted mortality" = number of deaths expected based on assessed physiologic risk of mortality. Include all PICU patients < 18y/o admitted to PICU for greater than 2 hours with at least 2 consecutive sets of VS consistent with life with risk of mortality assessment [NQF]		NQF

ICU: Intensive Care unit; OR: Operating Room; CVP: Central Venous Pressure; CVC: Central Venous Catheter; VAP: Ventilator-Associated Pneumonia; PICU: Pediatric Intensive Care; GI: Gastro-Intestinal; SOFA: Sequential Organ Failure Assessment; RN: Registered Nurse; UTI: Urinary tract Infection. Meaning of organizations' acronyms can be found in Table 1.